

R & D Connections

No. 22 • November 2013

Using Argumentation Learning Progressions to Support Teaching and Assessments of English Language Arts

By Yi Song, Paul Deane, Edith Aurora Graf, and Peter van Rijn¹

Key Concepts

Learning progression: In the CBAL research initiative, a learning progression is defined as a description of qualitative change in a student's level of sophistication for a key concept, process, strategy, practice, or habit of mind.

Common Core State Standards (CCSS): A

set of curricular goals in English language arts and mathematics adopted by most states for students in grades K–12.

Component task: A task that targets a specific skill in the learning progressions.

Scenario-based task: A set of activities that integrate reading, writing, and critical thinking within a storyline.

Over the past few decades, there has been an increasing concern that educational assessment provides little support for classroom learning. Some people question the value of traditional summative assessments used in schools, and fear that teachers lack high-quality formative assessments that target core skills in their curriculum. This problem motivates researchers and educators to investigate best practices for using assessment to inform instruction and learning. One such effort is the Cognitively Based Assessment of, for, and as Learning (CBAL™) research initiative, which draws upon curriculum standards and learning sciences research. The CBAL initiative aims to build a model for an innovative K–12 assessment system that documents what students have achieved (*of learning*); helps identify how to plan instruction (*for learning*); and is considered by students and teachers to be a worthwhile educational experience in and of itself (*as learning*) (Bennett, 2010). In this article, we will show how learning progressions — describing how students' skills develop over time — can support teaching and assessments. We begin by giving a brief overview of research on learning progressions under the CBAL project, in order to demonstrate how test performance supports inferences about student competency. We proceed to illustrate the theoretical framework using argumentation learning progressions and present assessment items designed to measure the skills addressed by the progressions.

CBAL™ Learning Progressions

How do you know when a student is ready to take the next step in learning new skills? This is one of the key questions educators face in their daily work. Introducing a skill or concept too early will likely result in frustration and a failure to learn. Spending time on a skill or concept that the student already understands will likely result in boredom and disengagement. It is therefore crucial to know where a student stands on his or her path towards mastery, but finding that out is not a simple task. One potential solution to this problem, which has received increased attention in educational research, is the application of *learning progressions*.

¹ Editor's note: Yi Song, Associate Research Scientist; Paul Deane, Principal Research Scientist; and Edith Aurora Graf, Research Scientist, work in the Research & Development division at ETS. Peter van Rijn is a Research Scientist for ETS Global BV.

“Introducing a skill or concept too early will likely result in frustration and a failure to learn. Spending time on a skill or concept that the student already understands will likely result in boredom and disengagement.”

The term “learning progression” was first introduced to describe possible levels in student development of a specific skill or concept in the context of science assessment (e.g., see Corcoran, Mosher, & Rogat, 2009, p. 37), but is now also applied to other domains. Thus, it is not surprising that the definitions of learning progressions held by researchers vary slightly. In the CBAL project, a learning progression is defined as a description of qualitative change in a student’s level of sophistication for a key concept, process, strategy, practice, or habit of mind (see CBAL Wiki at <http://elalp.cbalwiki.ets.org/Outline+of+Provisional+Learning+Progressions>).

Learning progressions can inform both assessment and instruction by *making the expected developmental sequence explicit*. Unlike the Common Core State Standards (CCSS), which focus on defining grade-level expectations, the CBAL learning progressions emphasize *qualitative shifts in performance* that indicate when students are ready to move on regardless of grade. In other words, learning progressions support the design of assessment tasks intended to measure student qualitative achievement levels. The assessment results can then be used to recommend classroom activities that can help students proceed to the next qualitative level. Each progression is presumed to be modal — that is, to hold for most, but not all, students. The CBAL learning progressions for English language arts (ELA) are provisional models, subject to empirical verification and theoretical challenge.

There are more than 40 ELA learning progressions within the CBAL project, covering major skills in reading and writing activities.² To illustrate our research approach, we will focus on four learning progressions tied to argumentation, which is an important research strand under the CBAL project. Argumentation skills are critical both in the classroom and in the real world. Students must learn to state their own positions, evaluate arguments, and respond to different perspectives if they are to become successful professionals and members of a democratic society. Argumentation is emphasized in the CCSS for English (Council of Chief State School Officers & National Governors Association, 2010), but it is a skill that many students currently lack, which leaves them ill-prepared for college and careers. We know from research that students find it challenging both to interpret arguments in a text (Chambliss, 1995; Larson, Britt, & Larson, 2004) and to produce their own arguments in writing (Ferretti, MacArthur, & Dowdy, 2000; National Center for Education Statistics, 2008; Persky, Daane, & Jin, 2003). We also know that traditional instruction covers the basics of composition (e.g., writing a five-paragraph essay), but places little emphasis on argumentation and its related critical thinking skills (Hillocks, 2002). In particular, argumentation is a complex and challenging skill to teach.

To support instruction and learning about argumentation, the CBAL project creates new forms of assessment that go beyond traditional summative assessment. Our development approach is based on *evidence-centered design* (ECD; Mislevy, Steinberg, & Almond, 2003), a method that maps how test performance supports inferences about student competency. We drew upon curriculum standards and learning sciences

² A teacher needs to deal with only a subset of the progressions related to what he or she is teaching in a given grade or grade span.

“Argumentation is ... a skill that many students currently lack, which leaves them ill-prepared for college and careers.”

research to develop a competency model that defines the major skills needed in argumentative reading and writing activities. Then we developed *argumentation learning progressions* that help measure the level of argumentation skills students have reached and to support teachers as they guide their students to higher levels of performance. Each level of these progressions is keyed to relevant classroom activities that help students develop their argumentation skills.

Argumentation Learning Progressions

Argumentation is a dialogue in which participants can take different positions and change their minds as it proceeds. In order to successfully engage in such a dialogue, participants should normally go through five phases in an argumentation cycle (see Figure 1). These five phases are outlined below.

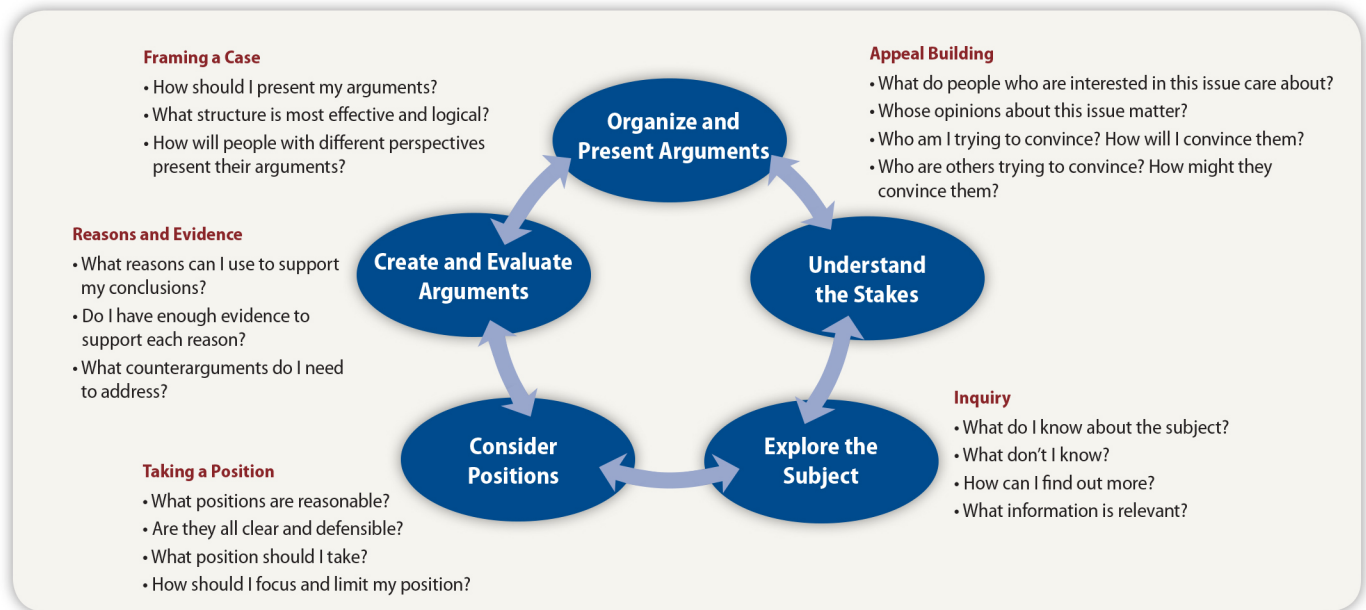
- 1) **Understand the stakes:** To make effective appeals in an argument, students must understand the stakes, which involves thinking about the context and the target audience.
- 2) **Explore the subject:** To have a meaningful conversation about a topic, students must understand it. Shallow knowledge leads to ineffective argumentation.
- 3) **Consider positions:** To play a role in an argumentative dialogue, students must take a position and consider the positions others have presented.
- 4) **Create and evaluate arguments:** To defend a position, students must present plausible reasons and evidence and address counterarguments. They should also evaluate the arguments to identify unwarranted assumptions that could undermine the logic.
- 5) **Organize and present arguments:** To join the discussion, a student must frame his or her own case, and consider how to structure and present each argument.

The actual process of building an argument is flexible and fluid. People can start anywhere in the argumentation cycle and proceed in any direction between parts of the process. They may even repeat steps when needed.

Each of these phases draws upon a different set of skills that requires separate learning progressions. The argumentation learning progressions are aligned with four of the five phases given in Figure 1:³

- 1) Appeal Building (understanding the stakes)
- 2) Taking a Position (considering positions)
- 3) Reasons and Evidence (creating and evaluating arguments)
- 4) Framing a Case (organizing and presenting arguments)

³ Exploring the subject is aligned with the inquiry learning progression, which is considered a more general literacy skill that is used across genres.

Figure 1. Five phases of participating in argumentative discourse.

Each of these skills has its own progression through five developmental levels (see Table 1):

- *Preliminary* (expected by pre-K to second grade)
- *Foundational* (expected by upper elementary)
- *Basic* (expected by middle school)
- *Intermediate* (expected by high school)
- *Advanced* (mastered in college or graduate school)

Grade information reflects a general sense of what is considered developmentally appropriate for students at different points in their school careers, but it does not tie specific learning progression levels to particular grade levels, since students' skills and prior knowledge may vary widely. It is possible for a high school student to be working at a preliminary level with challenging material, or for a strong fourth-grade student to be tackling basic-level tasks with material he or she knows well.

The qualitative shifts in the CBAL argumentation learning progressions correspond to the developmental milestones in argumentation skills suggested by researchers. Consider the *Reasons and Evidence* learning progression in Table 1. Researchers have found that most students can state an opinion and offer at least one reason for it at a fairly early age (e.g., McCann, 1989). Logically, this skill should be placed at the preliminary level. At the next level (i.e., foundational), we specify that students can elaborate their reasons and start to understand evidence, which is based on empirical findings that students begin to elaborate and provide details in support of their arguments as they reach the upper-elementary grades (Ferretti et al., 2000; Ferretti, Lewis, & Andrews-Weckerly, 2009). Subsequently, we expect that students'

“To support instruction and learning about argumentation, CBAL creates new forms of assessment that go beyond traditional summative assessment. Our development approach is based on evidence-centered design, a method that maps how test performance supports inferences about student competency.”

understanding and use of evidence become relatively mature at the basic level. In contrast, some skills could be challenging to students and might not develop before adulthood unless instruction or scaffolding is provided. For example, students find it difficult to analyze the assumptions behind their arguments even when they have reached middle or high school (Kuhn, 1991), and it is rare for students of any age to present arguments from both sides of an issue in their writing (Kuhn & Crowell, 2011; Kuhn & Udell, 2003). Refuting opposing viewpoints presents an even greater challenge (Ferretti et al., 2000; Knudson, 1992; Leitão, 2003; Nussbaum & Kardash, 2005). These skills are placed at the intermediate or advanced level in the *Reasons and Evidence* learning progression. As shown in Table 1, students only gradually develop full control over all elements of a well-structured argument, which generally reflects the developmental trends identified by research.

Because they are hypotheses, the argumentation learning progressions must be carefully validated. Thus far, we have done an extensive literature review, conducted an initial empirical study, and consulted four external experts in the field of teaching argument-related skills. These outside experts agreed with the main focus of each progression, but also raised some issues, including:

- the importance of describing changes in what students know about argumentation, not just in what they can do when confronted with an argument;
- the importance of introducing counterargument and critique from the earliest stages of instruction; and
- the social nature of argumentation, and the importance for instruction of treating argumentation as a dialogue between people with different perspectives.

We have integrated each of these concerns into the current version of the learning progressions.

Table 1. Overview of Argumentation Learning Progressions

	Social	Conceptual: Argument Building	Conceptual: Argument Building	Discourse
	Appeal Building	Taking a Position	Reasons and Evidence	Framing a Case
Preliminary	Understands the idea of trying to convince someone by making some sort of persuasive appeal	Understands the idea of taking a side in an argument and accepting or rejecting another person's statements as true or false based on how well one thinks it fits the facts	Understands the idea that positions may need to be supported with reasons that will be convincing to the audience	Approaches argument as a chain of individual turns, and understands and produces such turns in context, such as taking a position or giving a reason
Foundational	Transfers the idea of making a persuasive appeal into a written context and does some simple analysis of how oneself or an author might appeal or has appealed to different audiences and interests	Understands and expresses positions in writing with reasonable attention to what one knows and some ability to focus on what is important in the domain	Recognizes, generates, and elaborates on reasons in writing, with some awareness of the need for evidence, and uses one's own arguments to counter others' arguments in an engaging, familiar context	Approaches persuasive text as a coherently organized sequence of reasons supporting a position
Basic	Infers rhetorical structure in texts, and builds rhetorical plans of one's own that coordinate multiple appeals and rhetorical moves into a coherent effort to persuade a target audience	Understands and expresses positions clearly, capturing their relationships to similar and contrasting points of view	Understands use of evidence and clearly grasps the need to provide evidence and reasons that are directly relevant to and support the main point and which are logically sound	Approaches persuasive text as a logically structured presentation of a case with embedded reasons and evidence
Intermediate	Shows flexibility in interpreting and developing rhetorical plans, with sensitivity to differences among audiences with different points of view	Successfully analyzes unstated assumptions, biases, and other subjective elements in a text and can use that to develop one's own position more clearly	Understands the role of critique and rebuttal and is able to reason about and respond to counterevidence and critical questions	Approaches persuasive text as part of a dialogue between multiple perspectives with appropriate attention to counterpoint and rebuttal
Advanced	Displays a well-developed rhetorical (metacognitive) understanding of persuasion	Can use others' arguments to develop one's own understanding and then frame one's own position in terms that exploit the current "state of discussion"	Builds systematic mental models of entire debates, and use that model to frame one's own attempts to build knowledge	Displays mastery of many different forms of argument, demonstrating flexible understanding and control of genre features

Applying Argumentation Learning Progressions to Assessment Design

When designing assessments, we want to elicit evidence of the level of understanding that students have reached. We are therefore using argumentation learning progressions as a framework for assessment development. This section will not only provide examples of component tasks (i.e., tasks that target specific skills identified in the learning progressions) aligned to the *Reasons and Evidence* learning progression, but will also show a scenario-based task set that integrates reading, writing, and thinking related to argumentation.

Component Tasks

We have developed multiple sets of component tasks for each targeted skill in the argumentation learning progressions to capture sufficient evidence about the levels of student skills in argumentation. To illustrate, this section includes sample items for *Reasons and Evidence*, and each item is designed to measure a skill at a specific level in this progression. The following preliminary-level item (Reason-1-E) measures a student's ability to generate individual reasons to support a specific point, in sentence form. It asks students to write one reason for celebrating birthdays in the classroom and one reason against it. Students are only expected to give simple responses, like "Birthday parties make kids feel happy and appreciated" or "Kids might get competitive about bringing in the best birthday cake."

Reason-1-E

C B A L Reason-1-E-A Birthday Parties 44:49

Directions: Usually your school does not let students celebrate their birthdays in the classroom, but now your principal is thinking about changing this rule. She will ask students to vote on the issue.

Because the principal wants students to think carefully before voting, she has asked everyone to think of one reason **FOR** celebrating birthdays in the classroom and one reason **AGAINST** it.

For: Write one reason why it would be a good idea to celebrate birthdays in the classroom. Write at least one complete sentence and give specific details.

Against: Write one reason you think it would NOT be a good idea to celebrate birthdays in the classroom. Write at least one complete sentence and give specific details.

When students reach the foundational level, they can generate multiple reasons to support a position and embed those reasons in a paragraph-length position statement. This skill is what we try to assess in the next item (Reason-2-E), which asks students to write a paragraph to address the issue of whether or not parents should pay their children for doing chores at home. Students are expected not only to

express their position, but also to explain their supporting reasons. In contrast to the preliminary level, we expect students to develop multiple arguments and elaborate to a greater degree.

Reason-2-E

The screenshot shows a software interface for a listening task. At the top, there is a header bar with the letters 'C B A L' in green boxes, the title 'Reason-2-E-A Chores', and a timer showing '44:49'. Below the header, a green box contains the following text:

Some parents give their children money for doing chores around the house. Other parents expect children to do these chores without pay, as part of their family responsibility.

What is your position on the issue: Should parents pay their children for doing chores at home?

Below this, a white box contains instructions for the response:

In the box below, write a paragraph (3-5 sentences) in which you

- clearly state your position on the issue and
- explain your main reasons for supporting that position.

Use correct sentence structure, grammar, and punctuation.

At the bottom of the white box is a large, empty rectangular area for writing the response.

At the basic level, students should demonstrate skills in building logical, hierarchically structured arguments. The following two screen shots display an item (Reason-3-E) that assesses the targeted skill. Students first read some background information about the metric system as well as a fact sheet and then decide their position on the issue of whether or not the United States should switch to the metric system. They should use the given information as evidence and then arrange reasons and evidence to support main and subsidiary points. Obviously, this task involves a more complicated skill than what the foundational level requires.

Reason-3-E

CBAL

Frame 3-E
Still Inching Along

40:32

Still Inching Along, Out of Step with Other Countries

There are two major systems of measuring things: the international metric system (used by most of the world) and "customary units" (used in the United States).

Our country has never adopted the metric system. Instead, we continue to measure most things the way people did in the Middle Ages – in feet, yards, tablespoons, cups, pounds, and other customary units, also known as the Imperial system.

**United States
(Customary Units System)**

Unit	Count
Inches in a Foot	12
Feet in a Yard	3
Yards in a Mile	1760
Ounces in a Pound	16

**Most of the World
(Metric System)**

Unit	Count
Millimeters in a Meter	1000
Meters in a Kilometer	1000
Grams in a Kilogram	1000
Kilograms in a Tonne	1000

CBAL

Still Inching Along
1 of 1

40:32

Should the United States switch to the metric system?

Facts

The Imperial system was originally developed in England but is no longer used there.

The international metric system was originally developed in France and now is the official system in every country except the United States, Liberia, and Burma.

In 1999, the Mars Climate Orbiter Spacecraft was lost because of a communications error: one team working on the spacecraft used metric units and the other team used Imperial units.

The United States customary system originated in measurements that are related to those of the human body, such as an inch being the width of a thumb, or a foot the length of a foot.

In using multiples of twelve, the United States customary system is like clocks around the world.

The metric system is based on multiples of ten, just like our mathematical system of numbers.

In the United States, scientific research is conducted using the metric system.

United States currency is based on multiples of ten.

Most cars show speed in both miles per hour and kilometers per hour.

Countries that changed to the metric system usually experienced some opposition to this change, especially because of the costs of making the switch.

Directions: Read the information sheet and decide if you want to argue for or against our country's changing to the metric system. In addition to the facts provided, you may also include any other accurate information that will help support your argument.

Then use the template below to create an outline of your argument:

Main Point:

Reason 1:

Support for Reason 1:

Reason 2:

Support for Reason 2:

Reason 3:

Support for Reason 3:

Conclusion:

At the intermediate level of the *Reasons and Evidence* learning progression, students should be able to write simple critiques or rebuttals to other people's arguments. To measure this skill, we have developed specific tasks that require students to

critically evaluate others' arguments. The next item (Reason-4-E⁴) is a good illustration. Specifically, students are asked to write a critique of Redman's argument about the author of Shakespeare's work — that is, to identify reasoning flaws in the argument. We normally give students information (e.g., a fact sheet in Reason-4-E) about the topic or issue under discussion, which allows us to focus on their ability in using evidence to evaluate arguments.

Reason-4-E

The screenshot shows the CBAL interface. At the top, there is a header with the CBAL logo, a progress indicator '1 of 6', and a timer '40:32'. Below the header, there are two tabs: 'Edward de Vere' and 'Fact sheet'. The 'Edward de Vere' tab is active, displaying the following text:

Edward de Vere, the Real Author of Shakespearean Literature
By Marco Redman

It is impossible that the person named William Shakespeare could have written *Hamlet*, *Twelfth Night*, *The Tempest*, the sonnets, or indeed any of the so-called Shakespearean works.

To begin with, Shakespeare was the son of a glove maker, and there are no records of his even having attended the Stratford grammar school. Yet the plays and poems often refer to classical literature and include many characters who are aristocrats. Then, many of the plays are set outside England, and Shakespeare is not known to have traveled to any other country. Even the name "Shakespeare" is suspicious because it is spelled differently in the various places where it is written. And why are there no manuscripts of the plays in Shakespeare's handwriting?

The person who created Shakespeare's works must have been highly educated and well traveled—someone like Edward de Vere, the seventeenth earl of Oxford. He attended Cambridge University, traveled to several countries in Europe, and of course knew many of his fellow aristocrats. Like King Lear, he had three daughters.

But more important, de Vere was a poet, seems to have written some drama, and sponsored acting companies. Even though only a small number of his poems survive, de Vere is known to have experimented with different forms of verse, and his writing was praised by some of his contemporaries.

On the right side of the interface, there is a 'Directions' box:

Directions: Using the information in the Shakespeare and de Vere fact sheet as well as your own reasoning, write a one- to two-page critique of Redman's argument that Edward de Vere was the author of the works attributed to Shakespeare.

In your critique, be sure to do the following.

- Explain how certain information in the fact sheet could undermine the argument.
- Point out any faulty reasoning of which de Vere may be guilty.

Below the directions is a large empty box for the student's response.

The advanced level requires students to demonstrate their full mastery in creating and evaluating arguments. They should be able to write extended discussions and critiques that place arguments in the larger context or discourse. The tasks therefore normally involve reading multiple articles and conducting research to understand current issues. In addition, students should show how their arguments contribute to the ongoing discourse. For example, one task asks students to propose a policy for using computers in the classroom and to explain how their policy addresses the research findings on multitasking and learning outcomes that are described in the given articles.

Component tasks allow teachers to identify specific skills with which a student has difficulty. For instance, is a student challenged by using evidence (tested by a basic-level item) or by writing a debatable and focused thesis statement (tested by a foundational-level item)? Does a student fail to interpret arguments in a text (reading skills), to express her own arguments (writing skills), or to use appropriate strategies to analyze arguments (critical thinking skills)? If a student easily identifies major

⁴ The screen shot does not show all the text by Marco Redman. When the item is administered online, students can scroll down the bar to read the full text. In addition, they can click the menu "Factsheet" to check information.

reasons in an article, but struggles with creating her own arguments, the teacher could brainstorm reasons with her and model ways to introduce reasons in an essay. Hence, component tasks, if used in combination with learning progressions, can support classroom instruction purposefully.

Scenario-Based Tasks

A second important strand of assessment development focuses on scenario-based tasks that integrate reading, writing, and critical thinking within a storyline. Though component tasks try to separate these modes for certain purposes, they are not independent, but support one another and draw upon many of the same underlying activities (e.g., Deane, 2011; Hayes & Flower, 1980; Newell, Beach, Smith, & Van Der Heide, 2011). For example, a reader may have to evaluate someone else's argument. When the reader switches roles and starts writing a response, he or she will have to formulate new arguments and think critically about how other people will evaluate them.

One of the scenario-based assessment sets, namely CBAL Junk Food (a scenario about whether or not junk food should be sold in school), is designed to assess a group of argumentation skills through four tasks, the last of which calls for the integration of those skills. In the first task, students read short articles about the issue of banning junk food in school and summarize their major arguments. The second task asks students to organize people's statements by deciding which side each statement supports and to evaluate whether a piece of evidence supports or weakens a particular claim. In the third task, students critique arguments in a letter to the editor. They are expected to identify and explain problems in the reasoning or use of evidence. Finally, students write a persuasive essay for their local newspaper to express their opinion on the junk food issue. We have mapped each task to a particular level of an argumentation learning progression, which supports useful inferences about students' performance.

Junk Food Scenario

The screenshot shows the CBAL Writing interface for the 'Junk Food' scenario. At the top, there is a navigation bar with 'Junk Food', 'Question #', and 'Timer' buttons. The main title 'CBAL Writing' is displayed in a stylized font. Below the title, the scenario question is presented: 'Should junk food be sold in school?'. A text box explains the project: 'Everyone is discussing whether or not junk food should be sold at school. You and your classmates are trying to learn more and make up your own minds. In this project, you will research the issue, explore arguments on both sides of the issue, and write an essay for your school newspaper to explain your point of view.' Below this, a list of four tasks is provided: Task 1: Read and Summarize Arguments; Task 2: Analyze Arguments; Task 3: Review the Argument in a Letter to the Editor; Task 4: Present Your View in an Essay.

The scenario-based task design on the previous page has two important features. First, it can help address a common problem in writing assessments — i.e., that students tend to write in a vacuum and hence are ill-prepared to make arguments of their own. After reading articles and analyzing people's arguments about junk food, students are likely to have a better understanding of the issue and have more meaningful arguments in their essays. For instance, they can use information in the articles as evidence to support their arguments rather than making things up.

Another important feature in our task design is the scaffolding elements embedded in an assessment. For example, in the summary task for the Junk Food assessment, students are initially given a few suggestions for how to write a good summary of someone else's argument. Then they read sample summaries and evaluate whether these summaries make good use of the suggestions. Finally, they are asked to identify problems in each summary. Once they have been introduced to the characteristics of a good summary, students are required to write summaries of their own. This process provides scaffolding to students who otherwise might not have been able to complete the task. It also provides students with a set of standards for quality work that we want them and their teachers to internalize, to make a habit of mind. Teachers can integrate such tasks into their curriculum, deciding when and how they would like to use our formative materials based on what levels their students have reached.

Conclusion

The ability to present and evaluate arguments is an essential skill for advanced academic work in many fields and for a variety of professions (Graff, 2003). Specifically, the Common Core State Standards put an emphasis on writing logical arguments, requiring that students demonstrate sound reasoning and use relevant evidence (Council of Chief State School Officers & National Governors Association, 2010). In this article, we used argumentation learning progressions to demonstrate how our approach guides assessment development and informs instruction. We described how one aspect of argumentation skills develops through five hypothetical levels and showed the items and tasks for collecting evidence about a student's performance level. Initial empirical data on scenario-based task sets have recovered a sequence of levels as we envisioned (Graf & van Rijn, 2012), and we will continue conducting studies to evaluate the progressions. Our materials (e.g., learning progressions, handbooks, scenario-based assessment sets, and component tasks), some of which have been illustrated in this paper, can be used in flexible ways to suit teachers' instructional purposes and to meet students' learning needs.

Acknowledgments

We would like to thank Mary Fowles, Katherine Jueds, Nora Odendahl, RoseAnn Morgan, and Susan Dasch for their contributions to the assessment design. We also want to thank Margaret Vezzu and Debra Pisacreta, who storyboarded the assessment items.

References

- Bennett, R. E. (2010). Cognitively based assessment of, for, and as learning: A preliminary theory of action for summative and formative assessment. *Measurement: Interdisciplinary Research and Perspectives*, 8, 70–91.
- Chambliss, M. J. (1995). Text cues and strategies successful readers use to construct the gist of lengthy written arguments. *Reading Research Quarterly*, 30, 778–807.
- Corcoran, T., Mosher, F. A., & Rogat, A. (2009). *Learning progressions in science: An evidence-based approach to reform*. New York, NY: Center on Continuous Instructional Improvement, Teachers College, Columbia University.
- Council of Chief State School Officers, & National Governors Association (2010). *Common Core State Standards for English language arts and literacy in history/social studies, science, and technical subjects*. Washington, DC: Author. Retrieved from <http://www.corestandards.org/ela-literacy>
- Deane, P. (2011). *Writing assessment and cognition* (ETS Research Report No. 11–14). Princeton, NJ: ETS.
- Ferretti, R. P., Lewis, W. E., & Andrews-Weckerly, S. (2009). Do goals affect the structure of students' argumentative writing strategies? *Journal of Educational Psychology*, 101(3), 577–589.
- Ferretti, R. P., MacArthur, C. A., & Dowdy, N. S. (2000). The effects of an elaborated goal on the persuasive writing of students with learning disabilities and their normally achieving peers. *Journal of Educational Psychology*, 93(4), 694–702.
- Graf, E. A., & van Rijn, P. W. (2012). *Recovery of learning progressions in CBAL English language arts and mathematics*. Paper presented at the annual meeting of the Northeastern Educational Research Education (NERA), Rocky Hill, CT.
- Graff, G. (2003). *Clueless in academe: How schooling obscures the life of the mind*. New Haven, CT: Yale University Press.
- Hayes, J. R., & Flower, L. S. (1980). Identifying the organization of writing processes. In L. Gregg & E. R. Steinberg (Eds.), *Cognitive process in writing* (pp. 3–30). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Hillocks, G., Jr. (2002). *The testing trap: How state writing assessments control learning*. New York: Teachers College Press.
- Knudson, R. E. (1992). The development of written argumentation: An analysis and comparison of argumentative writing at four grade levels. *Child Study Journal*, 22(3), 167–184.
- Kuhn, D. (1991). *The skills of argument*. New York: Cambridge University Press.
- Kuhn, D., & Crowell, A. (2011). Dialogic argumentation as a vehicle for developing young adolescents' thinking. *Psychological Science* 22(5), 545–552.



R&D Connections is published by

ETS Research & Development
Educational Testing Service
Rosedale Road, 19-T
Princeton, NJ 08541-0001
email: RDWeb@ets.org

Editor: Hans Sandberg
Copy Editor: Eileen Kerrigan
Layout Design: Sally Acquaviva

Visit ETS Research &
Development on the web
at www.ets.org/research

Follow ETS Research on Twitter®
([@ETSresearch](https://twitter.com/ETSresearch))

Copyright © 2013 by Educational Testing
Service. All rights reserved. ETS, the ETS logo
and LISTENING. LEARNING. LEADING. are
registered trademarks of Educational Testing
Service (ETS). CBAL is a trademark of ETS. All
other trademarks are the property of their
respective owners. 24166

- Kuhn, D., & Udell, W. (2003). The development of argument skills. *Child Development*, 74(5), 1245–1260.
- Larson, M., Britt, M. A., & Larson, A. A. (2004). Disfluencies in comprehending argumentative texts. *Reading Psychology*, 25, 205–224.
- Leitão, S. (2003). Evaluating and selecting counterarguments: Studies of children's rhetorical awareness. *Written Communication*, 20(3), 269–306.
- McCann, T. M. (1989). Student argumentative writing: knowledge and ability at three grade levels. *Research in the Teaching of English*, 23, 62–76.
- Mislevy, R. J., Steinberg, L. S., & Almond, R. G. (2003). On the structure of educational assessments. *Measurement: Interdisciplinary Research and Perspectives*, 1, 3–67.
- National Center for Education Statistics. (2008). *The nation's report card: Writing 2007* (U.S. Department of Education Publication No. NCES 2008-468). Washington, DC: U.S. Government Printing Office. Retrieved from <http://nces.ed.gov/nationsreportcard/pdf/main2007/2008468.pdf>
- Newell, G. E., Beach, R., Smith, J., & Van Der Heide, J. (2011). Teaching and learning argumentative reading and writing: A review of research. *Reading Research Quarterly*, 46(3), 273–304.
- Nussbaum, M. E., & Kardash, C. M. (2005). The effects of goal instructions and text on the generation of counterarguments during writing. *Journal of Educational Psychology*, 97(2), 157–169.
- Persky, H. R., Daane, M. C., & Jin, Y. (2003). *The nation's report card: Writing 2002* (U.S. Department of Education Publication No. NCES 2003-529). Washington, DC: U.S. Government Printing Office.

